APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/788,148	02/16/2001	Barry Wendt	S30.12-0002	4295

				EXAMINER
27367	7590	03/13/2006		SETH, MANAV

WESTMAN CHAMPLIN & KELLY, P.A.
SUITE 1400 - INTERNATIONAL CENTRE
900 SECOND AVENUE SOUTH
MINNEAPOLIS, MN 55402-3319

ART UNIT	PAPER NUMBER
2625	

DATE MAILED: 03/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on <u>09 January 2006</u>.

2a) ☐ This action is **FINAL**.   2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) <u>1,63-68 and 85-87</u> is/are pending in the application.

    4a) Of the above claim(s) <u>69-84</u> is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) <u>1,63-68 and 85-87</u> is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All b) ☐ Some * c) ☐ None of:

      1. ☐ Certified copies of the priority documents have been received.

      2. ☐ Certified copies of the priority documents have been received in Application No. _____.

      3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Response to the Amendment

1.   Amendment filed on January 9, 2006 has been entered in full.

2.   Applicant's amendment to the claim 1 has been entered in full and is persuasive. Objection

on the respective claim have been withdrawn.

3.   Applicant's amendment to the specification with respect to the drawings has been fully

entered. In view of the amendment to specification, the objections on the respective drawings have

been withdrawn.

4.   Applicant's amendments and arguments to the amended claims have been fully considered

but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 102

5.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6.   Claims 63-65 and 67 are rejected under 35 U.S.C. 102(b) as being anticipated by Ratha et al.,

1995, "Adaptive flow orientation based feature extraction in fingerprint images".

Claim 63 recites "A computer implemented method for evaluating image quality, the

method comprising: obtaining a raw scan image; selecting at least one image portion from

the raw scan image". Ratha discloses obtaining a raw scan image (Figure 6, 1st step, Obtaining

Gray Scale Image) and further discloses selecting **at least one image portion from the raw scan**

image (page 12, 2nd para., Under topic "Proposed Algorithm", "To accurately determine the local

orientation field, the input image is divided into equal-sized blocks (windows) of 16 x 16 pixels.

Each block is processed independently").

Ratha further discloses generating a collection of slope-oriented data that

corresponds to said at least one image portion of the raw scan image; and utilizing said collection of

slope oriented data as a basis for determining a quality classification of said at least one image

portion (page 13, figure 6 –"compute block direction & smooth, last paragraph – "the orientation

field is used to compute the optimal ridge direction in each 16 x 16 window or block; page 14,

compute gradient, compute direction, compute the variance of gray levels in a direction orthogonal

to the orientations field in each block; page 16, 2nd paragraph, the use of variance computed to

decide the quality of image, image quality classification: good, medium, poor).

Claim 64 has been similarly analyzed and rejected as per the arguments and citations of

claim 63.

Regarding claim 65, Ratha discloses utilizing the slope representation to determine an

additional classification based on a brightness level within at least a portion of the raw scan of the

image (page 16, 2nd paragraph).

Regarding claim 67, Ratha discloses preprocessing the at least one image portion to

generate a monochrome image (section 3.1).

Claim Rejections - 35 USC § 103

7.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness

rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section
> 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the
> subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary
> skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the
> invention was made.

8.   Claims 68 and 1 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ratha et al.,

1995, "Adaptive flow orientation based feature extraction in fingerprint images" further in view

Davis, U.S. Patent No. 5,420,937.

Regarding claim 68, Ratha discloses recites wherein generating said collection of slope

oriented data comprises dividing the monochrome image into a plurality of pixel grids and

performing a contour trace through said plurality of pixel grids and recording a set of corresponding

data and utilizing said set of corresponding data to calculate a slope value for each pixel grid; and

recording said slope value in the collection of slope oriented data (Section 3.1, page 12-14). Ratha

discloses the computing of the slope oriented data but does not expressly disclose generating a slope

table. However, Davis discloses creating a minutia table including slope (col. 8, lines 50-65; col. 11,

lines 64-68 through col. 12, lines 1-5). Therefore, it would have been obvious for one of ordinary

skill in the art at the time of invention was made to combine the teachings of Ratha and Davis

because they are from the same field of endeavor of fingerprint image processing and Ratha

provides a well-known methodology routinely implemented in the art for representing statistical

information, which can be used in subsequent stages for further image processing.

Also, Davis discloses generating a monochrome image and further discloses diving the monochrome image into a plurality of pixel grids (figure 3, col. 16, lines 66-68 through col. 17, lines 1-15; col. 3, lines 55-68; col. 6, lines 38-55).   Davis further discloses "performing a contour trace through said plurality of pixel grids and recording a set of corresponding data in a raw slope data table; utilizing said set of corresponding data to calculate a slope value for each pixel grid; and recording said slope in the collection of slope oriented-data" in (Figures 3, 4, 8, 9 and 10; col. 17, lines 1-15, where bordering is contour tracing; col. 3, lines 55-68; col. 4, lines 58-38 through col. 5, lines 1-12; col. 6 lines 30-68).

Regarding claim 1, Ratha discloses preprocessing at least a portion of the at least one image portion of the raw scan image to obtain a monochrome image; and creating a wire frame image based on the monochrome image (figure 6, thinning). Generating a wire frame image from a binary black and white image is nothing but obtaining a thinning or skeletonized image, which is very well known in the art of image processing and this is further also disclosed by Davis in the background of the invention (col. 1, lines 54-68 through col. 2, lines 1-3).

9.   Claim 66 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ratha et al., 1995, "Adaptive flow orientation based feature extraction in fingerprint images" further in view Davis, U.S. Patent No. 5,420,937 and further in view of Gagne et al., U.S. Patent No. 5,363,453.

Claim 66 recites "The method of claim 63, further comprising at least temporarily terminating subsequent processing if the quality classification does not meet a predetermined reference threshold". Ratha does provide the process of quality classification but do not expressly teach at least temporarily terminating subsequent processing if the quality classification does not

meet a predetermined reference threshold. Davis discloses "When an aberration test fails, the next test in the sequence proceeds" which clearly provides the teachings how a system can be programmed to perform quality check and thus a program can be programmed, as well known, according to user's choice of operations to be performed. Davis does not specifically teach the conditions as recited in claim 66 but examiner asserts that there are very well known security identification systems that are available which rather than performing several tests would temporarily terminate subsequent processing if the quality classification does not meet a predetermined reference threshold and would indicate "invalid" and such systems including such a feature would further provide more sensitivity towards invalid data scanned. However examiner cites Gagne to further provide the support for above arguments. Gagne, same as Ratha and Davis, is directed to fingerprint analysis for identification purposes. Gagne clearly teaches "to determine whether or not a fingerprint sample is approved, a "confidence level" has to be achieved. This confidence level starts at zero......the actual confidence level that must be achieved in order for a fingerprint to be "approved" is again determined by the specific application. One end-user might want a higher confidence level than another end-user. After all element have been compared, and the confidence level is determined, a flag is set to indicate whether of not the sample has "passed" the confirmation process" (col. 15, lines 30) and further teaches that this confirmation can be done in ten steps or can be done in 2 steps and therefore examiner here asserts that it clearly is a user's selection to select a number of steps for confirmation and therefore it would have been obvious for one of ordinary skill in the art at the time of invention was made to combine the teachings of Ratha, Davis and Gagne to temporarily terminating subsequent processing if the quality classification does not meet a predetermined reference threshold because it would provide more sensitivity towards invalid data scanned and as it would merely be a matter of user's selection to provide better sensitive system.

10.   Claims 85-87 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ratha et al.,

1995, "Adaptive flow orientation based feature extraction in fingerprint images" further in view

Davis, U.S. Patent No. 5,420,937 and further in view of Yamamoto, U.S. Patent No. 5,239,590.

Regarding claim 85, as discussed in the rejection of claims 63-65 and 67-68, Ratha

discloses "obtaining a raw scan of an image; preprocessing the raw scan to obtain a monochrome

image; generating a collection of slope-oriented information based on the monochrome image;

dividing the monochrome image into an array of pixel grids". Both Ratha and Davis are directed to

verification systems to verify that a person is who he or she claims to be and these systems compare

biometrics such as fingerprints to the reference biometrics or biometrics (fingerprints) stored in the

database (col. 8, lines 50-65; col. 19, lines 53-65), where apparently (a) when the input fingerprint

characteristics matches the reference fingerprint, the person is verified and identified, and (b) when

the input fingerprint characteristics does not match the reference fingerprint, the person is not

verified and not identified. Both Ratha and Davis does not expressly teach the specifics such as

"executing a count of pixels within at least one pixel grid of the array of pixel grids; comparing the

count of the pixels in the at least one pixel grid to a reference; and determining a quantified

classification as a relation of the count of the pixels to the reference", therefore examiner cites

Yamamoto to provide these teachings. Yamamoto, same as Ratha and Davis, discloses "a

verification processing system 20 which comprises an image processing portion 21 and a card reader

22. Master data (reference data) is read when the person being examined inserts an ID card 27 into

the card reader 22. Then the comparison of the input data from the input image system 10 with the

master data is performed by a computer 23. The comparison results are displayed at a display

portion 24. When the comparison results come up to standard (coincidence of the fingerprints), an

actuator 25 is operated and a door 26 is opened" (col. 3, lines 55-65). Yamamoto further discloses

dividing the master (reference) image and input image into plurality of pixel blocks (col. 6, lines 30-50). Yamamoto further teaches comparing the number (count) of pixels in each block of the input image and master image (col. 2, lines 40-47) and further support can be found in col. 9, lines 45-55. Therefore, it would have been obvious for one of ordinary skill in the art at the time of invention was made to use Yamamoto's teaching in the combined invention of Ratha and Davis of comparing input fingerprint with the reference fingerprint because all the references are directed to same field of endeavor and Yamamoto's invention make it possible to realize accurate fingerprint verification using a small volume of data (See Yamamoto, col. 11, lines 15-17) by comparing the count of pixels with a good image pixels.

Claim 86 recites "the method of 85, wherein the reference comprises a threshold pixel count". As discussed in the rejection of claim 85, since input image block's pixel count is compared to the reference image block's pixel count to verify the identity and to classify input image quality, the pixel count of reference image will apparently be seen as threshold pixel count by one of ordinary skill in the art.

Regarding claim 87, as discussed in the rejection of claim 85, reference image is divided into blocks. Since it can be divided into blocks or since a portion of reference image can be selected, and as it being an image itself, it is well known that image processing can be processed (tuned) on an image to further improve the quality and further enhance the features for reasons of analysis.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Manav Seth whose telephone number is (571) 272-7456. The examiner can normally be reached on Monday to Friday from 8:30 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta, can be reached on (571) 272-7453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Manav Seth
Art Unit 2625
February 28, 2006

BHAVESH M. MEHTA
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600